NPIC/TSSG/RED/SDB-012-70
24 February 1970

MEMORANDUM FOR THE RECORD

SUBJECT: Reported Astigmatism in a Dual-Viewing Microstereoscope

1. During testing and evaluation of the first production unit of the Dual-Viewing Microstereoscopes an anomaly in the left optical train of the instrument became evident, which was identified by TEB/ESD as on-axis astigmatism. TEB measured the anomaly by placing opthalmologists discs over the eyepieces of the microstereoscope and reported that the aberration was corrected by discs totaling +3.75 diopters of cylindrical correction. Such a large amount of on-axis astigmatism would be intolerable.

2. Subsequent investigation of the problem produced inconclusive results. The test procedure, using ophthalmologists discs to determine the magnitude of the aberration, seems to be in question. An experiment conducted by TEB using four subjects to test the use of a cylindrical lens to determine the astigmatism of the Dual-Viewer, did not produce conclusive results.

3. Three representatives of IEG observed the aberrations and stated that although they could see the astigmatism, it did not appear to be of importance. Indeed, they reported that the quality of the imagery observed and the resolution achieved seemed to indicate a very good optical system.

4. Similar aberration has been observed by MB on a few of the operational Zoom 240 Microstereoscopes that are in daily use. Seemingly, this aberration does not disturb the PI.

25X1 5. [redacted] the manufacturer of the Dual-Viewing Microstereoscope, takes the position that astigmatism of such magnitude would inevitably destroy the excellent resolution achieved and the good
25X1 imagery observed. [redacted] documented this position.

6. Consulting with several knowledgeable people, did not produce a proven and satisfactory method for determining the magnitude of astigmatism in an optical system. The consultants did not establish an allowable maximum for the aberration.

7. A specification for astigmatism was not included in the technical requirements for the Dual-Viewing Microstereoscopes. Therefore, the aberration would presumably not determine the contractual acceptability of the instrument unless the anomaly was clearly not up to good commercial standards. Proof of this seems somewhat questionable at this point.

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8. The aberration does not appear to affect the operational usefulness of the instrument in any way. A satisfactory focus can be achieved by the optical system in question. Resolution is very good and the quality of observed imagery is excellent.

9. It must be admitted that some degree of on-axis astigmatism appears to be present in the subject instrument. However, in view of the somewhat inconclusive results of the technique used to measure the aberration, without a proven and acceptable technique and without established limits and tolerances for the aberration for measurement, it appears that the more subjective evaluations as to the effect of the anomaly should permit a decision to accept the instrument in its present condition.

[redacted] 25X1

Project Monitor
TSSG/RED/SDB

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Orig - RED rt & file
1 - NPIC/TSSG/ESD/TEB
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1 - DIA/SPAD
1 - CIA/IAS
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25X1 NPIC/TSSG/RED/SDB/[redacted] (24 Feb 70)

TRANSMITTAL SLIP	DATE 24 Feb 70

TO: Coleen

ROOM NO.	BUILDING

REMARKS:

FROM: OL

ROOM NO.	BUILDING	EXTENSION

FORM NO. 241 1 FEB 55 REPLACES FORM 36-8 WHICH MAY BE USED. (47)